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Individual differences in action identification and depression: the relationship with visual perspective in autobiographical memory

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ABSTRACT

Personal memory is an influential factor in constructing self-identity. The way one views themselves based on past events significantly affects mental processes in the present, impacting not only wellbeing but also attitudes and opinions that guide future behaviour. It is therefore hugely important to understand the mechanisms by which mental disorders influence everyday memory functioning. Depression and visual perspective (observer and own-eyes) of mental imagery are both associated with varying levels of cognitive processing and action identification, which has been a target for therapeutic treatment in the past. This study therefore aimed to investigate the relationships between action identification, depression, and visual perspective of autobiographical memory. 116 participants reported spontaneous visual perspective ratings for 10 specific memories, 4 of which were subsequently shifted to the opposite perspective and rated again. Standardised questionnaires were distributed to measure action identification and depression. Correlation and mediation analyses were conducted, yielding no significant results. The findings are discussed in terms of the confounding variables that may have opposed the predicted effects and therefore need to be controlled for in future research within this field.

KEYWORDS: AUTOBIOGRAPHICAL MEMORY, VISUAL PERSPECTIVE, ACTION IDENTIFICATION, DEPRESSION

Autobiographical memory is arguably one of the most important contributors involved in defining the self. The dependence of identity on personal memory is highlighted in numerous cases involving memory impairment. From head-injury patients losing both episodic memory and their sense of self simultaneously (Schacter, 2008), to Alzheimer's patients showing a decline in the strength and quality of identity with disease progression (Rose Addis & Tippet, 2004), it is clear that autobiographical memory plays a fundamental role in how individuals view themselves. Interestingly, it is not only the content of autobiographical memory that influences identity processes, but *how* the past event is remembered in the present (Wilson & Ross, 2003). Memory retrieval mechanisms can result in a number of alterations in the way a past event is perceived in the present, such as changes to the subjective temporal distance of the event (Ross & Wilson, 2002), the intensity of emotions associated with the event (Schaefer & Philippot, 2005), and the visual perspective adopted during recall (Nigro & Neisser, 1983). Pointedly, these alterations guide and regulate emotions towards particular life events with the aim to enhance wellbeing (Bluck, 2003) and promote a coherent, stable identity over time (Conway, 1996). This, in turn, provides attitudes and opinions that guide future behaviour (Cohen & Conway, 2007). It is therefore hugely important to understand the variations in autobiographical memory retrieval that can result in changes to current self-identity and subsequent behaviour, paying particular attention to the possible underlying mechanisms responsible for impaired wellbeing.

The present study focuses primarily on visual perspective during retrieval, specifically, whether events are remembered from first or third person perspectives. Nigro and Neisser (1983) first distinguished the phenomenological characteristics of memory retrieval into two perspective categories. First person perspective, otherwise referred to as 'field' or 'own-eyes' perspectives, denotes those memories seen in the mind's eye as it was originally experienced. On the other hand, third person (or 'observer') perspective involves recalling the event from the viewpoint of an observer, where one can see themselves in the memory. Numerous studies have since confirmed not only Nigro and Neisser's (1983) original proposal that certain properties of events at encoding determine the perspective at retrieval, but also that each perspective influences the subjective experience and the information recalled during retrieval. Regarding the latter phenomena, own-eyes perspectives have been found to evoke more emotional reliving (Berntsen & Rubin, 2006), vividness of mental imagery (Robinson & Swanson, 1993), and details of both psychological state and physical sensations (McIsaac & Eich, 2002) in comparison to observer perspectives. Additionally, observer perspectives have been found to maximise integration of contextual information during retrieval (Valenti & MacGregor, 2011, *cited in* Libby & Eibach, 2011), allowing individuals access to information beyond that of the remembered episode. Furthermore, these findings have also been reinforced by neuroimaging studies, whereby activity in brain areas associated with interoceptive awareness is reduced when an observer, as opposed to own-eyes, perspective is employed at retrieval (Eich, Nelson, Leghari, & Handy, 2009), and thus provides a

possible neuronal mechanism by which observer perspectives dampen emotional reliving.

The idea of an association between observer perspectives and a broader context can be explained as a reflection of higher levels of processing. Libby, Shaeffer, and Eibach (2009) first proposed that perspective is used as a representational tool whereby the level of meaning inferred from a memory is bi-directionally related to the perspective applied at retrieval. Own-eyes perspective represents a bottom-up approach to understanding the meaning of a remembered event, with a focus on concrete features such as the internal psychological state and physical sensations at the time of encoding, hence focusing on *how* the action was carried out. Observer perspective, on the other hand, utilises a top-down approach to infer meaning from incorporating the wider context of the situation, such as the motivations behind behaviour, the consequences of action, and thus *why* the action was carried out. This classification of events based on level of meaning is known as action identification theory (Vallacher & Wegner, 1987); a hierarchically organised cognitive framework for defining event meaning, ranging from low-level (concrete) to high-level (abstract) construal's. The significance of this lies with the notion that visual perspective corresponds to the identification of the remembered event, and thus on a psychological level, it determines the meaning of the event itself in the present (Asch, 1940, Schaeffer, 2009).

Furthermore, the ways in which things are recalled in the present have also been explored in the growing body of research assessing the role of visual perspective in self-evaluative processes. As discussed earlier, retrieved visual perspective is hypothesised to act as a mechanism to maintain a coherent sense of self over time and promote wellbeing (Bluck, 2003), and does so by influencing a number of internal assessments with reference to one's current self-concept. A primary focus in the literature has therefore been the level of congruency between the remembered event and current views of the self. The subsequent findings (Sutin & Robins, 2008, Libby & Eibach, 2002, Libby, Eibach, & Gilovich, 2005) posit that memories for events that are incongruent with the current self-concept will be retrieved using an observer perspective in order to distance oneself from the past and reduce feelings of inauthenticity. However, memories for events that are congruent with the current self are remembered using an own-eyes perspective in order to focus on similarities between the past and present selves and enhance feelings of authenticity. A further theory is that the motivation to disown or claim the past event also influences the perspective used at retrieval (Sanitioso, 2008), such as adopting an own-eyes perspective when recalling a memory with desirable self-attributes with the aim to boost one's current sense of self and verify self-beliefs (Swann, Rentfrow, & Guinn, 2003). In this respect, visual perspective acts as a distancing mechanism, whereby negative or damaging experiences are recalled from an observer perspective, thus the memory has reduced interoceptive awareness and becomes less relevant to the present self (Sutin & Robins, 2008), whereas positive experiences are recalled from

an own-eyes perspective to have the opposite effect (see *also* Construal Level Theory, Trope & Liberman, 2003).

The impact of these processes on present self-evaluation is important to understand because of the resultant effect they have on an individual's current mental state. Previous research has shown that mental disorders utilise visual imagery differently compared with normal controls (Holmes & Mathews, 2010). For example, post-traumatic-stress disorder (PTSD) is characterised by highly vivid and emotional intrusive memories related to a previous trauma (Brewin, Dalgleish, & Joseph, 1996), and individuals with social anxiety commonly report experiencing self-focused negative imagery of poor social outcomes from an observer perspective (Hirsch, Meynen, & Clark, 2004). Notably, some mental disorders have been found to influence the overall prevalence of observer or own-eyes visual perspective in autobiographical memory. Depressed individuals, for example, have been shown to preferentially retrieve memories from an observer perspective (Kuyken & Howell, 2007), regardless of the memory age or content. Likewise, depressed individuals exhibit a reduction in own-eyes perspectives specifically for positive memories (Bergouignan et al, 2007), compared to normal controls that recall positive experiences from an own-eyes perspective to minimise psychological distance. Furthermore, research has revealed a role of overgeneral autobiographical memory (OGM) in depressed individuals. Williams and Broadbent (1986) first described this phenomenon as the tendency to recall less specific and/or more general past events, and subsequent study has confirmed that increased OGM is a characteristic of depression (Williams et al, 2007). Thus, a common method used in life review therapy promotes the retrieval of specific events in order to reduce the associated depressive symptomatology (Serrano, Latorre, Gatz, & Montanes, 2004). Importantly, these findings indicate an impairment of autobiographical memory retrieval in depression, with observer visual perspective acting as a focal point for overgeneralisation of memory, reduced interoceptive awareness, negative self-evaluation, and the distancing of oneself from positive past experiences in the maintenance of the disorder (Kuyken & Moulds, 2009).

The role of action identification with these personal-past related depressive symptomatology, however, remains unclear. In healthy individuals, it is hypothesised that cognitive processing is continuously adapted via action identification, whereby the level of abstraction shifts in response to specific circumstances such as current mood state (Vallacher & Wegner, 1987). Research into this has revealed that happy moods result in more abstract processing, whereas sad moods result in more concrete processing (Beukeboom & Semin, 2005). In depressed individuals, however, this relationship appears to be dysfunctional, with individuals exhibiting highly abstract processing, despite their negative affect (Kuyken & Moulds, 2009). Perhaps the inability to regulate and adapt the level of action identification to suit the current needs of the individual is responsible for this abstract processing with negative mood (Watkins, 2008). Due to the functional equivalence of action identification with visual perspective (Libby et al, 2009), one can extend this finding to infer that impairment in visual perspective and related processes could be an underlying depressive

psychopathology (Watkins, 2011). Research into other defining characteristics of depression provide further support for this theory. The feeling of hopelessness is thought to derive from an impairment in prospection resulting in a negative view of the future (Roepke & Seligman, 2016). Recent evidence suggests that envisioning the past, hence adopting a visual perspective to retrieve the past, and imaging the future utilise the same core brain network within the medial prefrontal and medial temporal structures (Botzung, Denkova, & Manning, 2008). The significance of this stems from the idea that depression is a consequence of impairment to this core brain network (Williams et al, 1996).

The present study aims to investigate the individual differences within action identification and depression and their relationship with visual perspective in autobiographical memory, with the hope that this may aid in the understanding of possible mechanisms and the impact of depression on every day memory functioning. This study therefore has a number of hypotheses. Firstly, based on Kuyken and Howell (2007), and Libby et al (2009), individuals that score highly on the depression and/or behaviour identification scales will report a greater proportion of naturally occurring observer visual perspectives. Secondly, due to the similarity between action identification and visual perspective, and the finding that depressed individuals exhibit a deficit in the ability to flexibly shift their level of identification to match current situational demands (Watkins, 2008), it is hypothesised that higher levels of depression will correlate with an increased difficulty in shifting visual perspective. Lastly, the relationship between depression and visual perspective vantage point will be mediated by action identification level, as depressed individuals think more abstractly (Kuyken & Moulds, 2009).

Methods¹

Participants

One-hundred-and-eighteen participants at the University of Sussex, aged between 18 and 34 ($M = 21.25$ years, $SD = 2.07$ years), consented to the study. Of these, 40 were male, 77 were female, and one not recorded. Seventeen participants did not go on to the second part of the study due to having low own eyes and observer visual perspective ratings for all memories, therefore their data will be included for analyses involving part one and part three only. Two participants did not complete either the first and second, or the third part(s) of the study respectively and so were excluded from analysis due to incomplete data sets. One-hundred-and-sixteen participants (40 males, 76 females, $M = 21.23$ years, $SD = 2.07$ years) were therefore included for analysis involving part 1 and part 3, and 99 participants (34 males, 65 females, $M = 21.25$ years, $SD = 2.16$ years) were included for analysis involving parts 1, 2, and 3.

Participants were recruited using email advertisements to psychology students enrolled at the University of Sussex, as well as poster advertisements placed around the campus. Further participants consisted of an opportunistic sample obtained by the experimenters. The only requirement for participation in the study was age above 18 years due to the exploratory nature of the experiment. Ethical issues concerning the study related to the possibility of inducing emotional distress (see *appendix A for a review of these issues*). Ethical approval for this study was obtained from the University of Sussex Psychology Research Ethics Committee.

Materials

The ten cues for typical events in part one of the study were made up of slight adaptations from the events used in Nigro and Neisser's (1983) seminal study, which have also been previously employed by both Rice and Rubin (2011) and McDermott, Wooldridge, Rice, Berg, and Szpunar (2016).

Seven standardised questionnaires were distributed to participants during the third part of the study. These consisted of the Vividness of Visual Imagery Questionnaire (VVIQ, Marks, 1973), which examines the clarity of one's mental imagery. Additionally, the Object-Spatial Imagery Questionnaire (OSIQ, Blajenkova, Kozhevnikov, & Motes, 2006) that aims to examine one's object and spatial mental representations respectively. Thirdly, the Behaviour Identification Form (BIF, Vallacher & Wegner, 1989), whereby everyday behaviours must be identified using abstract or concrete descriptions. A Perspective Taking and Spatial Orientation Test (PTSOT) developed by Hegarty and Waller (2004) was also used in order to test participant's mental rotation and spatial perspective abilities.

¹ *Note:* methods describe the entire experiment performed, with the inclusion of variables that are not discussed as the primary focus of this paper.

Mental health factors were measured using the State-Trait Anxiety Inventory (STAI, Spielberger & Gorsuch, 1983), the Centre for Epidemiologic Studies Depression Scale (CES-D, Radloff, 1977), and finally the Post Traumatic Stress Disorder Checklist for DSM-IV criteria (PCL-C, Weathers, Huska, & Keane, 1991). These standardised questionnaires aimed to screen for symptomatology associated with anxiety, depression, and PTSD.

Design

A within-subjects design was used for part two of the study whereby four visual perspective shifting conditions were used per participant for each of the four selected memories. Maintain OE condition involved maintaining an own eyes perspective, the Shifted OE condition involved shifting from an own-eyes to an observer perspective, the Maintain OB condition involved maintaining an observer perspective, and lastly, the Shifted OB condition involved shifting from an observer to an own eyes perspective. A questionnaire design was used for the remaining parts of the study.

Procedure

Upon entering the experimental cubicle each participant read through an information sheet and signed a consent form (see *appendix B*). The experimenter then administered the instructions (see *appendix C*) whereby definitions for key phrases were provided. Visual perspective was defined as the vantage point through which a memory is seen in the mind's eye, and it was highlighted that most memories are remembered in one of two ways; either the same way as encoding and therefore through one's own eyes, or through an observer viewpoint whereby one can see themselves in the memory. Vividness was described as the clarity of mental imagery depicting a memory, and emotional intensity was defined as the strength of the emotion associated with a memory, regardless of whether the emotion is positive or negative.

In the first part of the study, using the computer program MATLAB, participants were asked to retrieve and type a brief title for 10 specific autobiographical memories from the past three years, using the 10 cues for typical events in order to aid this process (see *appendix D*). Each time a memory was retrieved and titled the participant was asked to rate it on visual perspective, emotional intensity, and vividness using a visual analogue scale ranging from 'low' to 'high' (see *appendix C for an example*). Responses to these scales were recorded by the program to the nearest 0.25 within a maximum range of 0-100. Additional data regarding the origin of each visual perspective was recorded by selecting one option from a predetermined set of responses for each of the following three dimensions: height, location, and distance (see *appendix C for an example*).

The two memories most strongly associated with each of the visual perspectives were then selected by the program for use in the second part of the study. In order for a memory to be selected, the corresponding visual perspective ratings had to be above 60 for one perspective and below 50 for the other, with a larger difference between

these two ratings indicating a stronger association with the higher scoring perspective. Participants were asked to either maintain or shift their visual perspective for each of the selected memories. Specifically, for the two memories most strongly associated with an own eyes perspective, participants were asked to either maintain an own eyes perspective (Maintain OE) or shift to an observer perspective (Shifted OE). Similarly, for the two memories most strongly associated with an observer perspective, participants were asked to either maintain an observer perspective (Maintain OB) or shift to an own eyes perspective (Shifted OB). The order with which participants completed the conditions was randomised each time to avoid order effects in the results. Participants then had to rate each memory on difficulty, perspective maintenance, the number of perspective shifts during retrieval, strength of own-eyes and observer perspectives, vividness, and emotional intensity, using the same visual analogue scales from part one. Similarly, the origin for each of the four memories was categorised based on height, location, and distance, as was recorded in part one.

The final part of the study involved participants completing six standardised questionnaires (VVIQ, OSIQ, BIF, STAI, CES-D, and PTSD respectively) on an excel file followed by demographic information (*see appendix E*). Lastly, participants were given five minutes to complete the PTSOT using the computer program Anaconda (*see appendix F*). Participants were then fully debriefed by the experimenter at the end of the study, and were provided with a debriefing sheet (*see appendix G*).

Results

Preliminary Analysis

Depression scores were calculated for each participant by summing the responses to the CES-D questionnaire and subtracting 20 from the total². Action identification scores were calculated as the total number of higher-level alternative answers recorded in the BIF. Separate visual perspective scores were measured as participant's mean rating for own-eyes and observer perspectives across all ten memories from part one of the experiment. The average observer ratings were then subtracted from the average own-eyes ratings to give a single naturally occurring visual perspective score for each participant (cf Rice & Rubin, 2009). A score of zero indicates equal strength for both perspectives, whereas more positive scores indicate a stronger own-eyes perspective and more negative scores indicate a stronger observer perspective. Difficulty shifting was measured as the total summated difficulty ratings from the Shifted OE and OB conditions, whereby higher scores represent increased difficulty in changing visual perspective. Maintain OE and OB difficulty ratings were not included as they involved maintaining, rather than shifting, the original perspective.

² *Note.* one depression score was removed from the data set due to incorrect completion of the questionnaire by the participant resulting in a score of 72 out of a maximum 60.

Prior to the main analysis, a number of precautionary tests were carried out. Firstly, each data set was checked for normality by looking at skew and kurtosis values. By converting these to Z-scores, it was revealed that scores for depression ($p < .001$) and total shifting difficulty ($p < .05$) were significantly skewed. Upon inspection of visual plots, there appeared to be some additional issues with normality for the remaining variables. In order to objectively correct for this, original scores for all variables were converted to Z-scores to identify outliers and reduce bias. Using the rule denoting 95% of standardised residuals within each sample to fall within ± 1.96 , 99% of cases to fall within ± 2.58 , and 99.9% to fall within ± 3.29 , outliers were identified and the most extreme cases were winsorized by rearranging the z-score equation and replacing them with a score $\pm 1SD$ from the mean. This aims to reduce the number of cases violating the rule to an acceptable amount subject to each sample size. Winsorizing, rather than trimming the data, was used in order to maintain the original trend and prevent the removal of data that is representative of individual differences in the sample.

Firstly, three depression scores were winsorized, leaving five cases exceeding ± 1.96 , only one of which exceeded ± 2.58 . Secondly, four BIF scores were winsorized to leave five remaining cases outside ± 1.96 . Visual perspective scores were more problematic, with 13 scores needing winsorizing before violations were reduced to five ($p < .05$). Lastly, six difficulty scores were winsorized in order to reduce the number of violations to four ($p < .05$). Skew and kurtosis values were then recalculated and only the depression variable remained skewed ($p < .05$). In order to correct for this, the depression scores were transformed using a log transformation and the subsequent skew statistic was non-significant. A correlation was run between the transformed and non-transformed scores and they were found to be significantly correlated ($r = .980$, $p < .001$), therefore the log transformed depression scores will be used in further analysis unless stated otherwise.

Analysis

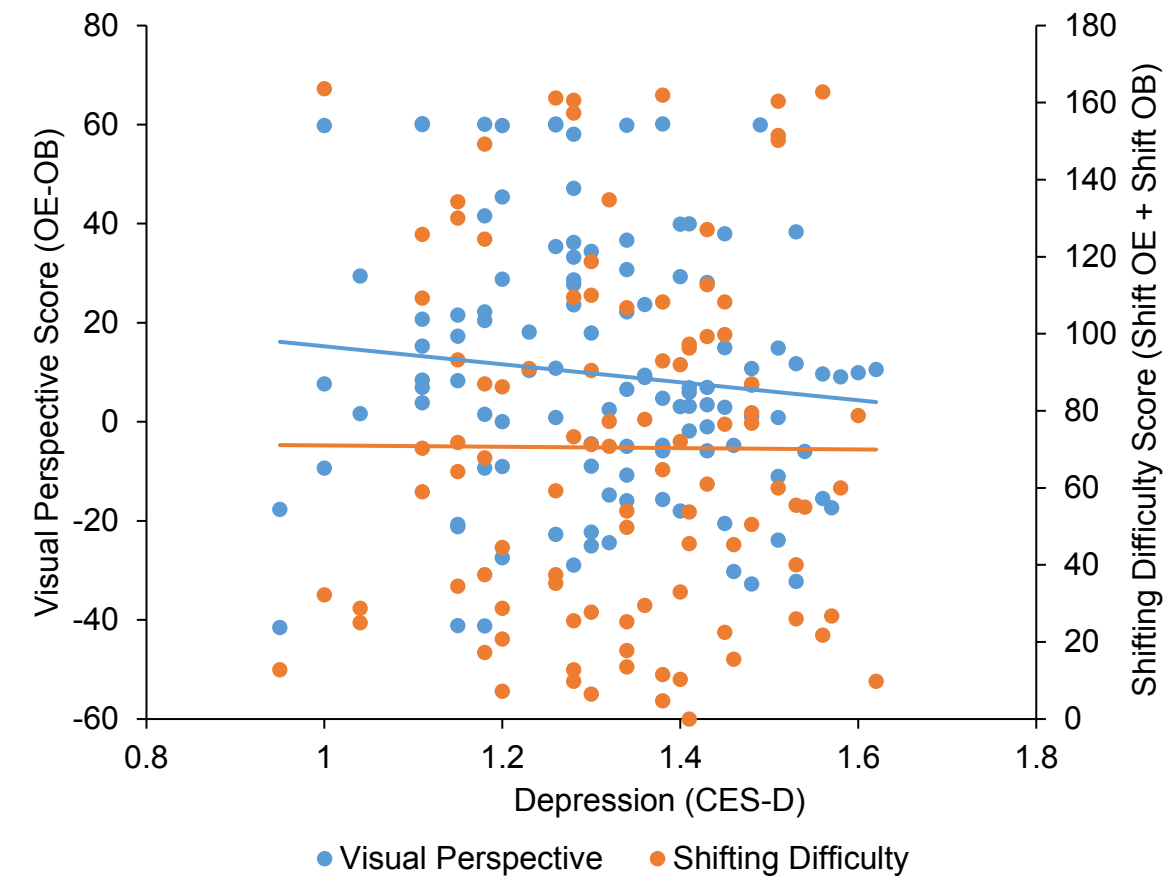


Figure 1: The Relationship between Depression with both Visual Perspective and Shifting Difficulty Scores

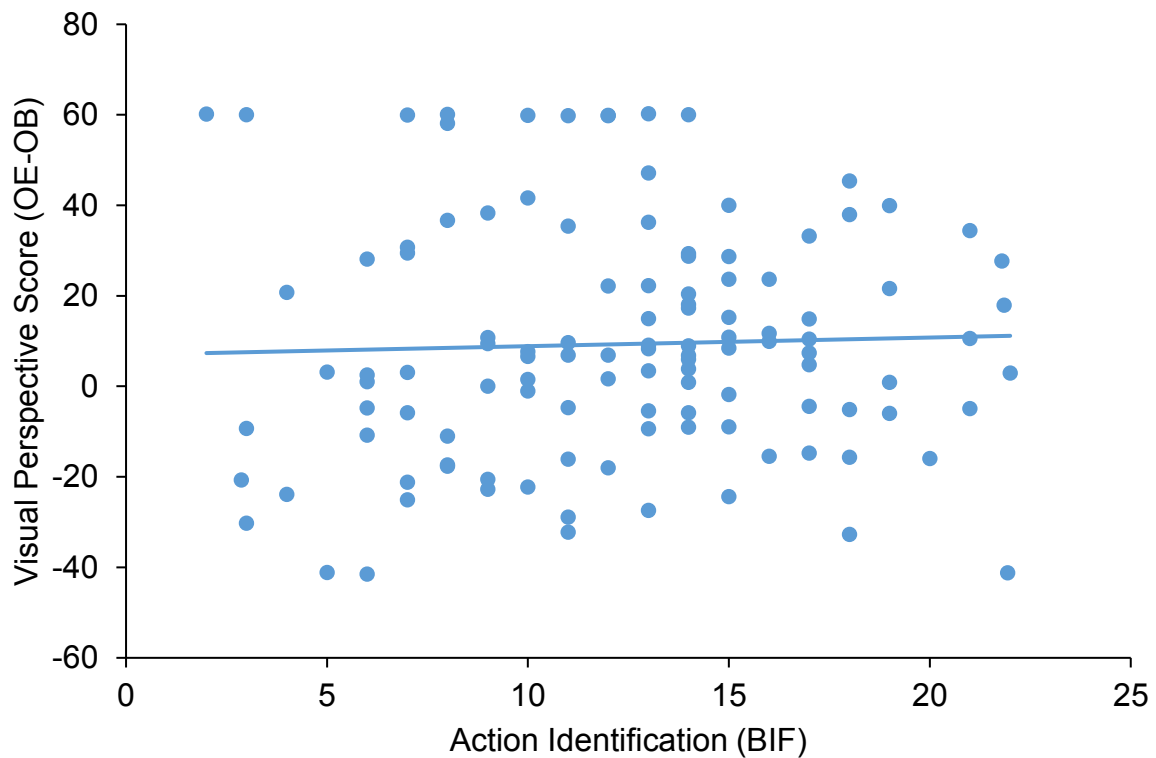


Figure 2: The Relationship between Behaviour Identification and Visual Perspective

Figures 1 and 2 show the relationships between the predictor variables of action identification and depression with the outcome variable scores for visual perspective and/or shifting difficulty. In order to determine the significance of these relationships, both depression and action identification were correlated with the outcome variable scores of visual perspective and shifting difficulty. The results of this are summarised in Table 1. Although non-significant, the slightly negative relationship between depression and visual perspective was in the predicted direction, with higher levels of depression being associated with weaker own-eyes perspectives, tending towards stronger observer perspectives. The hypothesis that individuals who think more abstractly would also exhibit stronger observer perspectives was not supported, with a non-significant positive relationship reflecting increased strength of own-eyes perspective with more abstract identifications. Additionally, the correlation between depression and shifting difficulty was extremely low ($r = -.010$, $p = .921$), reflecting a lack of relationship between the two variables and thus failing to support the hypothesis that depressed individuals would find it more difficult to shift visual perspective.

Table 1: Intercorrelations, Means, and Standard Deviations³ of Behaviour Identification, Depression, Visual Perspective, and Shifting Difficulty Scores

| | 1 | 2 | 3 | 4 | <i>M</i> | <i>SD</i> | <i>N</i> |
|--------------------------|------------|------------|------------|-------|----------|-----------|----------|
| 1. Action Identification | - | .123 | .036 | .113 | 12.31 | 4.82 | 116 |
| 2. Depression | $p = .190$ | - | -.107 | -.010 | 21.88 | 7.39 | 115 |
| 3. Visual Perspective | $p = .705$ | $p = .257$ | - | -.111 | 9.31 | 25.87 | 116 |
| 4. Shifting Difficulty | $p = .264$ | $p = .921$ | $p = .272$ | - | 70.79 | 45.80 | 99 |

Prior to running a mediation analysis, a number of assumptions were first checked. Using Baron and Kenny's (1986) criteria for mediator variables, [bidirectional] causality between predictor variables and the outcome were assumed based on previous research (*action identification and visual perspective*: Libby, Shaeffer, & Eibach, 2009, *depression and visual perspective*: Kuyken & Howell, 2007), in addition to linearity, homogeneity of variance, and normality that were already corrected for in the preliminary analysis.

³ *Note*: mean and standard deviation values for depression were taken from the data prior to log transformation.

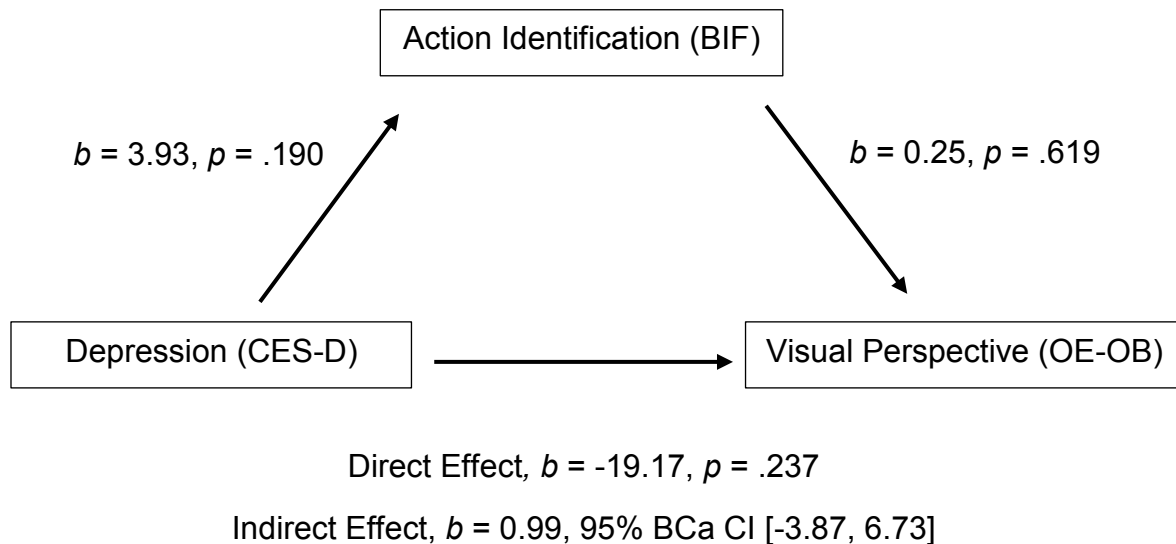


Figure 3: Model of Depression as a predictor of Visual Perspective, mediated by Action Identification. The bootstrapped confidence interval for the indirect effect is based on 1000 samples.

In order to examine the relationships among depression, level of action identification, and visual perspective scores, a regression-based path analysis was performed. This analysis aimed to estimate the indirect effect in a mediation model using Hayes (2017) PROCESS command as implemented in SPSS v. 24. The model will therefore examine evidence that the strength of the relationship between depression and visual perspective of autobiographical memory can be explained through the indirect effect of the mediator (action identification). Figure 3 depicts a diagram of the mediation model. Analysis of results show a non-significant indirect effect of depression on naturally occurring visual perspective through action identification, $b = 0.99, 95\% \text{ BCa CI } [-3.87, 6.73]$, with a corresponding small effect size, $b = 0.006, 95\% \text{ BCa CI } [-0.02, 0.04]$. However, the total effect of depression on visual perspective when action identification is not included in the model remains non-significant, $b = -18.18, t = -1.14, p = .257$. Overall, the predicted mediation of the relationship between depression and naturally occurring visual perspective by action identification was not supported by the results.

Discussion

The aim of the study was to investigate the individual differences within action identification, depression, and their relationship with visual perspective in autobiographical memory. Analysis of the data failed to reveal any significant findings and thus did not support the hypotheses of this experiment or previous findings in this area. There are a number of possible reasons for obtaining these results as opposed

to those expected. The following discussion aims to evaluate the obtained results in more depth with these alternative explanations.

Firstly, it was predicted that individuals with higher scores on the CES-D would retrieve memories with a stronger observer perspective compared to an own-eyes perspective. While a slight correlation was observed in this predicted direction, further analysis proved the relationship to be non-significant. Had this finding been significant, it would have supported previous literature and extend the current understanding of depressive pathology. This is because an increase in observer memories (strength and occurrence) correlates with reduced vividness and emotional intensity (Eich et al, 2009), which may be a precursor for OGM (Willimas & Broadbent, 1986). One could link this to identity processing, whereby depressed individuals define themselves based on negative experiences that have been generalised across all domains of the self (Kuyken & Moulds, 2009), or possibly even that the negative affect arises because they struggle to define their sense of self at all from these psychologically distanced, vague, and unemotional episodes (Sutin & Robins, 2008). Furthermore, an increase in observer perspective is associated with abstract cognitive processing (Libby et al, 2009), which in turn enables the individual access to information beyond the specific event and thus enables further evaluation of the self, intentions, and outcomes (Libby & Eibach, 2011). This may explain the rumination characteristic of depression, whereby individuals are constantly thinking about *why* past events have occurred and *why* they feel so negative (Watkins, 2011). While this explains the direction of the relationship between visual perspective and depression, however, it does not explain the lack of significance or the higher prevalence of own-eyes memories in general.

A number of variables may have resulted in a reduction of naturally occurring observer visual perspective overall (or an increase in own-eyes), despite the varying scores for depression. First and foremost, participants were instructed to recall memories from the last three years. Numerous researchers have concluded that remote memories are more likely associated with an observer perspective, and recent memories are more likely associated with an own-eyes perspective (Nigro & Neisser, 1983). While this instruction was put in place to prevent participants predominantly retrieving older events using an observer perspective such as childhood memories, it may have had the opposite effect. Further to this point is that the study took place on a university campus. As the sample consisted of university students, the vast majority of which (if not all) will have regularly attended the campus in question, being in that particular environment will have cued participants to retrieve specific events associated with the university. This idea is in line with encoding specificity principle (Tulving & Thomson, 1973) with reference to extrinsic context (Godden & Baddeley, 1980), and can be described as the spontaneous intrinsic activation of an autobiographical memory in response to a set of (or one specific) cue(s) (Bernsten, Staugaard, & Sorensen, 2013). This was originally demonstrated by Godden and Baddeley (1975) through the enhanced retrieval of information that was learned and recalled in the same environment (underwater) as opposed to different environments (learning underwater and recalling on land). The relevance of this is that events cued by (and hence

associated with) the university environment are more likely to have happened recently (<3 years), and thus are more likely to be retrieved using an own-eyes rather than observer perspective.

Similarly, it must be taken into consideration the effect of imagining, rather than remembering, specific episodes of the past. Autobiographical memory processes are both conscious and unconscious, and employ the same neural network involved in prospection, daydreaming, sleeping, and imagination (Schacter, Chamberlain, Gaesser, & Gerlach, 2012). Modern views of memory state that memories are constructions rather than reconstructions, and that all of these constructions involve false experience to some degree (Conway & Loveday, 2015). Recalling a specific episode, therefore, may unconsciously involve imagining certain aspects, especially if the individual is being suggested to retrieve an episode of a precise and constrained nature (Weingardt, Loftus, & Lindsay, 1995), as is in this study. Imagining events, such as future episodes, has previously been found to utilise more own-eyes visual perspectives, due to the reliance on readily available information based on recent past events (Johnson, Foley, Suengas, & Raye, 1988). The interchangeable nature of memory and imagination is therefore important in terms of this study because participants may be unknowingly imagining certain aspects of “giving an individual public presentation” or “running from a threatening situation” and thus are more likely to adopt an own-eyes visual perspective for the task. Further to this, participants may also be influenced by social factors such as the perceived ‘normal’ perspective, and therefore may report a particular perspective as dominant based on cultural and societal norms (Roediger, Meade, & Bergman, 2001). Future research could therefore look into the social and cultural influence as well as the difference between spontaneous and instructed visual perspective with regards to the suggestibility of memory.

The second hypothesis of the study concerned action identification. Specifically, it was expected that more abstract thinking individuals would report stronger observer perspectives. Again, this was not the case, with a non-significant relationship in the opposite direction being found. Considering individuals tend to use a more abstract level of identification in general (Vallacher & Wegner, 1987), this result is surprising. A possible reason for this is that participant’s scores on the BIF were not reflecting their level of action identification used when retrieving the memories previously. This is because it has been found that language has the ability to influence a person’s level of cognitive processing (Stapel & Semin, 2007). Specifically, the present study was focused on *how* a specific event was remembered, such as the emotional intensity and vividness, as opposed to *why* the event occurred. Thinking about the specific details and feelings of an event as it is experienced in the mind’s eye, without thinking about the general context of the situation or the motivations and consequences of actions, has been shown in the past to prompt more concrete levels of processing and a shift away from ruminative thinking (Watkins & Baracaia, 2002). This suggests that even participants high in depression and abstract thinking may have reported more own-eyes perspectives due to the design of the experiment.

Additionally, it has been theorised that difficult tasks initiate concrete levels of processing in order to focus on the 'here and now' and enhance problem-solving (Vallacher & Wegner, 1987). By not focusing on the information beyond that of the remembered episode such as context, it is easier to recall simple identities such as the vividness of the imagery being experienced. Perhaps participants adopted an own-eyes visual perspective and concrete level of identification during retrieval in order to complete the task at hand in the most cognitively efficient way. It would perhaps be interesting for future studies to look at different levels of cognitive load while retrieving and shifting between perspectives during the task. It must be noted, however, that if the nature of the study (difficulty of the task, language used, and the type of information being focused on during retrieval) predisposed participants to utilise concrete levels of identification, then one would expect to find an increased proportion of concrete scores on the BIF. Still, one could argue that the situational demands of the experiment were slightly altered between retrieving the memories in part one and completing the BIF in part three. Therefore, while participants were influenced to think concretely and recall specific events from an own-eyes perspective in part one, the BIF in part three was measuring participant's general level of identification and was not influenced by the current experimental design. Nonetheless, this suggests that action identification is perhaps more easily influenced and adapted than previously thought.

The third hypothesis predicted that depressed individuals would find it more difficult to shift from one visual perspective to the other, however the results showed that depression and shifting difficulty did not affect one another. Firstly, it is possible that the design of the study induced concrete thinking (Vallacher & Wegner, 1987) and thus own-eyes perspectives, as discussed above. If this was the case, then depressed individuals with a natural tendency to think more abstractly may find it less difficult to shift from an observer to an own-eyes perspective than non-depressed, less abstract thinking individuals shifting from an own-eyes to an observer perspective. This combined with the original hypothesis that depressed individuals find it difficult to shift perspective in general due to an impairment in the core brain network mediating memory retrieval, picturing the future, and imagination, would perhaps result in competing trends that appear to cancel each other out. Another explanation for the lack of correlation again draws on the design of the experiment. The original hypothesis was based on theories stating that depressed individuals fail to regulate the level of action identification by being unable to shift it to suit the changing circumstances (including mood) as is typically seen in healthy controls (Watkins, 2008, Forgas, 2008). While this may be true in real life events, the situational circumstances were not being manipulated during memory retrieval in the current experiment and therefore the increased difficulty in regulating the level of action identification and shifting visual perspective may not have been present. The ecological validity of the experiment is therefore questionable and the results may not be representative of real-life events (Brunswik, 1947), hence further research should focus on naturalistic situations and avoid laboratory environments.

Lastly, it was hypothesised that the relationship between depression and visual perspective would be mediated by action identification. Libby et al (2009) first theorised that visual perspective of retrieved memory is functionally equivalent to the level of action identification and cognitive processing defining the particular episode. Therefore as depressed individuals have been observed to exhibit highly abstract cognitive processing (Kuyken & Moulds, 2009), it is expected that they would also retrieve the majority of memories from an observer visual perspective, as has been demonstrated in the past (Kuyken & Howell, 2007, Bergouignan et al, 2007). For the reasons discussed previously, however, this may not have been the case in the present study due to methodological influence, and thus the BIF and reported visual perspective were representing functionally different processes. This idea is supported by the data in the lack of correlation between depression and action identification scores. An important factor to take into account, however, is the semantic confusion between visual perspective definitions. What is meant by this is that people may be seeing themselves in the memory *through their own eyes*, and are thus both the observer and the observed (see Christian, Miles, Parkinson, & Macrae, 2013). If this were the case, it poses many implications for research in this field in that there may be critical differences between the observer-as-the-self perspective and the observer-as-an-other perspective, such as the intensity of interoceptive awareness and self-evaluative processing that may have previously been overlooked. It would be interesting to look at the differences between these versions of an observer perspective in terms of depressive symptomatology and action identification, for example does the observer-as-the-self perspective fall above or below the observer-as-an-other perspective in the cognitive hierarchy.

To summarise, the present study fails to infer any meaningful results concerning the relationships between action identification, depression, and visual perspective in autobiographical memory. It does however, highlight the importance of future literature to explore and control for the numerous confounding variables that have internal and external influence on autobiographical memory retrieval. The impact of depression on everyday memory functioning needs further exploring in order to develop the necessary treatments to combat symptomatology such as ruminative thinking and hopelessness. Research should therefore target visual perspective related to negative affect specifically, and consider the role of continuous dynamic adaptations in action identification both during and outside experimental situations.

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